REMARKS/ARGUMENTS

Claims 27-52, 63-88 and 92-95 are pending in the application. Claims 27, 29, 63-88, and 94-95 are amended and no claims are cancelled or added. The amendments to the claims as indicated herein do not add any new matter to this application. Claims added since the issued patent are underlined with amendments stated in the remarks below. All issues raised in the Office Action mailed April 28, 2008, are addressed hereinafter.

MPEP 1453(V)(D) requires that amendments to claims in the Response that have been newly added since the issued patent be stated herein with the support in the disclosure. Claim 27 has been amended to add the limitation "wherein assigning the work partitions in a sequence includes assigning a first previously unassigned work partition to a particular entity of the plurality of entities, and when the particular entity completes processing the first work partition, picking a second previously unassigned work partition based at least in part to the size of the second work partition, and assigning the second unassigned work partition to the particular entity for processing." Support for limitation may be found in Col. 8, lines 7-34 of the Written Specification. In addition, the word "and" has been moved to precede the last limitation to follow correct grammar.

In Claim 28, the term "the hierarchy" has been amended to "a hierarchy" on line 15 in order to remove an antecedent basis problem. On line 22, "a hierarchy" has been amended to "the hierarchy" also to fix an antecedent basis problem.

Claims 63-88 and 94-95 have been amended to "computer-readable storage medium" so as to place the invention squarely within one statutory class of invention, as suggested by the Office Action.

ALLOWABILITY OF CLAIMS

The indicated allowability of Claims 39-41, 43-48, 75-77, 79-84, and 92-95 is gratefully

acknowledged. These claims have not been rewritten in independent form at this time however,

because it is believed that all of the pending claims are patentable over the references cited and

relied upon for at least the reasons set forth hereinafter.

The allowability of Claims 30-37 and 49-52 is gratefully acknowledged. In addition,

Claim 29 has been amended to overcome the rejection under 35 USC 112, 2nd paragraph and

should be allowed. Claims 65-73 and 85-88 have been amended to overcome the rejection under

35 USC 101 and should also be allowed.

CLAIM REJECTIONS--35 U.S.C. § 101

Claims 63-64, 65, 66-68, 69-70, 71-72, 73, 74-77, 78-84, 85-88 and 94-95 were rejected

under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory

subject matter. The Office Action states that the claims should be rewritten to "computer-

readable storage medium" so as to place the invention squarely within one statutory class of

invention. (*Office Action*, p. 3). In response, Applicants have amended the Claims to reflect the

suggestion in the Office Action. Thus, the rejection under 35 U.S.C. § 101 is overcome and the

claims should be allowed.

CLAIMS REJECTION—35 U.S.C. § 112, SECOND PARAGRAPH

Claim 29 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly having

insufficient antecedent basis for the claim term "hierarchy." In response, Applicants have

amended Claim 29 to "a̲ hierarchy". Thus, the rejection under 35 U.S.C. §112, second

paragraph, is overcome and Claim 29 should be allowed.

CLAIM REJECTIONS--35 U.S.C. § 102

Claims 27-28, 38, 42, 63-64, 74 and 78 were rejected under 35 U.S.C. § 102(b) as being

allegedly anticipated by Hongjun Lu and Kian-Lee Tan ("Dynamic and Load-balance Task-

Oriented Database Query Processing in Parallel Systems") ("*Hongjun*"). This rejection is

respectfully traversed.

As shall be explained below, each pending claim recites at least one limitation that is not

anticipated by *Hongjun*.

CLAIM 27

Claim 27, as amended, recites:

A method of parallelizing an operation, the method comprising the steps
of:
dividing the operation into a set of work partitions;
assigning work partitions from said set of work partitions to a plurality of
entities, wherein at least one entity of said plurality of entities is
assigned a plurality of work partitions from said set of work
partitions;
wherein the step of assigning work partitions is performed by assigning the
work partitions in a sequence based at least in part on sizes
associated with the work partitions;
said plurality of entities operating in parallel on work partitions assigned
to them to perform said operation; and
**wherein assigning the work partitions in a sequence includes
assigning a first previously unassigned work partition to a
particular entity of the plurality of entities, and when the
particular entity completes processing the first work partition,
picking a second previously unassigned work partition based
at least in part to the size of the second work partition, and
assigning the second unassigned work partition to the
particular entity for processing.** (emphasis added)

At least the above-bolded portions of Claim 27 are not anticipated by *Hongjun*.

Claim 27 recites "**wherein assigning the work partitions in a sequence includes assigning a first previously unassigned work partition to a particular entity of the plurality of entities, and when the particular entity completes processing the first work partition, picking a second previously unassigned work partition based at least in part to the size of the second work partition, and assigning the second unassigned work partition to the particular entity for processing**". The Office Action states that *Hongjun* anticipates this "as (sec 2.2) discloses 'the size of the task is the number of pages of data associated with the task and the size [of] the result generated is zero' as each task is completed the global information is updated and each time the processor finishes a task the processor check[s] for more tasks to acquire base[d] on the global information. Further more (sec 2.3 and 3.3) discloses task stealing which involves determining 'the amount of unfinished work to be performed' and being measured by 'estimated time needed to finish up the task' which in part is dependent on the size of the task." (*Office Action*, p. 4).

However, in *Hongjun*, the size of previously unassigned work partitions is never used as the basis for selecting which work partitions to assign. *Hongjun* states that "if there are tasks available in the system, the processor will be assigned **the next** task for execution." (*Hongjun*, sec 2.2). *Hongjun* never does state that the next task is based "at least in part to the size of the …work partition" as recited in Claim 27. In fact, nothing in 'Dynamic task acquisition and execution' (Sec 2.2) indicates anything analogous assignments made based on the size of the work partition.

The Office Action then alleges that task stealing may indicate that size is used to select

partitioning (based upon a goal of a minimum completion time). But Claim 27 is explicit that the

assignment of work partitions is for "previously unassigned work partitions." Task stealing is

unable to occur for unassigned partitions, as task stealing only occurs "when there is no more

tasks to be assigned". (*Hongjun*, sec 2.3). Thus, the operations in task stealing also do not apply

to the limitations of Claim 27.

Consequently, at least the above-bolded elements of Claim 27 cannot be anticipated by

Hongjun. As at least one element recited in Claim 27 is not anticipated by the cited art, it is

respectfully submitted that Claim 27 is patentable over the cited art and is in condition for

allowance.

CLAIM 38

Claim 38 recites:

A method for processing a query, the method comprising the steps of:
receiving a statement that specifies at least an operation;
**determining a user-specified degree of parallelism to use in
performing the operation;**
dividing the operation into a set of work partitions;
**performing a determination of how many entities to use to perform
said operation based, at least in part, on the user-specified
degree of parallelism;**
assigning work partitions from said set of work partitions to a plurality of
entities based on said determination; and
said plurality of entities operating in parallel on work partitions assigned
to them to perform said operation. (emphasis added)
At least the above-bolded portions of Claim 38 are not anticipated by *Hongjun*.

Claim 38 recites "**determining a user-specified degree of parallelism to use in**

performing the operation;… performing a determination of how many entities to use to

perform said operation based, at least in part, on the user-specified degree of parallelism".

The Office Action states that *Hongjun* anticipates this "as (sec 3.4) which discloses performance evaluation of the algorithm disclosed and 3 other algorithms for parallel processing of queries. This shows the ability to choose among each algorithm and each algorithm provide[s] a different level of parallelism." (*Office Action*, p. 5).

Hongjun, sec 3.4, does state the results of a performance study based upon the algorithm disclosed with experiments varying the number of processors, varying the skewness of data, and varying the number of partitions. The algorithm is actually never changed, only variables within the algorithm. In any case, no "user specified degree of parallelism" is determined as recited in Claim 38, much less using the user-specified degree of parallelism to determine how many entities to use. A user-specified degree of parallelism is an indication, *from a user*, of how much parallelism to use. For example, parallelism may not increase the performance of a table scan. (*Written Specification*, col. 10, lines 8-14). Thus, a user may then indicate that of no parallelism should be performed with a transaction. *Hongjun* does not indicate that a "user-specified degree of parallelism" is used or determined. Rather, only performance data is shown but that data is not used to fluctuate the algorithm in any way. Thus, at least one limitation of Claim 38 is not anticipated. As at least one element recited in Claim 38 is not anticipated by the cited art, it is respectfully submitted that Claim 38 is patentable over the cited art and is in condition for allowance.

CLAIM 42

Claim 42 recites:

A method of processing a query, the method comprising the steps of:
dividing an operation required by said query into a set of work partitions
      by generating a set of query fragments;

> **incorporating hints into at least some of said query fragments,**
> > **wherein the hint associated with a given query fragment indicates how to perform the work partition associated with said given query fragment;**
>
> assigning query fragments from said set of query fragments to a plurality of entities; and
>
> **said plurality of entities operating in parallel on query fragments assigned to them to perform said operation, wherein entities working on a query fragment associated with a hint perform the work partition associated with said query fragment in a manner dictated by said hint.** (emphasis added)

At least the above-bolded portions of Claim 42 are not anticipated by *Hongjun*.

Claim 42 recites "**incorporating hints into at least some of said query fragments, wherein the hint associated with a given query fragment indicates how to perform the work partition associated with said given query fragment;... said plurality of entities operating in parallel on query fragments assigned to them to perform said operation, wherein entities working on a query fragment associated with a hint perform the work partition associated with said query fragment in a manner dictated by said hint**". The Office Action states that *Hongjun* anticipates this "as (sec 3.3.1 and 3.3.2) discloses calculations for estimated finish time based on a task and its properties and using the estimation to determine how to distribute the task to idled processors." (*Office Action*, p. 5).

In Claim 42, hints are "incorporated … into at least some … query fragments" and "indicate how to perform the work partition associated with said given query fragment." For example, "An SQL statement can specify the degree of parallelism to be used for the execution of constituent parts of an SQL statement." (*Written Specification*, col. 10, lines 15-18). Thus, a hint is part of the query fragment itself.

Hongjun, on the other hand, never discloses anything analogous to a hint, much less a

hint incorporated into a query fragment. Rather, *Hongjun*, sec 3.3.1, states how a donor (the

processor from which a task is stolen) is determined. A formula is given that may be used to

determine an estimated finish time as the measure of a load on a processor. *Hongjun*, sec 3.3.2,

then states how determinations are made of the amount of data to be transferred. But nothing

analogous to a hint is incorporated into any of the "tasks" of *Hongjun*. Rather calculations are

made to determine a donor and the amount of data to be transferred, but no where does it state

that a hint is incorporated into a query fragment or task. Thus, at least one limitation of Claim 42

is not anticipated. As at least one element recited in Claim 42 is not anticipated by the cited art,

it is respectfully submitted that Claim 42 is patentable over the cited art and is in condition for

allowance.

Dependent Claims

Claim 28 depends upon independent Claim 27. Therefore, dependent Claim 28 also

includes the limitations of Claim 27. Thus, dependent Claim 28 is patentable for at least those

reasons given above with respect to Claim 27. In addition, Claim 28 introduces one or more

additional limitations that independently render it patentable. However, due to the fundamental

differences already identified, to expedite the positive resolution of this case a separate

discussion of those limitations is not included at this time, although the Applicants reserve the

right to further point out the differences between the cited art and the novel features recited in the

dependent claims.

Claims 63-64, 74, and 78 contain limitations similar to claims 27-28, 38, and 42 except

claims 63-64, 74, and 78 are recited in computer-readable medium format. Therefore, claims 63-

64, 74, and 78 also are patentable for at least the reasons given above with respect to claims 27-

28, 38, and 42.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims

are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is

believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is

believed that such contact would further the examination of the present application.

Please charge any shortages or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,

Hickman Palermo Truong & Becker LLP

Dated: ___7/28/08_____   ___/RobertSChee#58554/_____
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